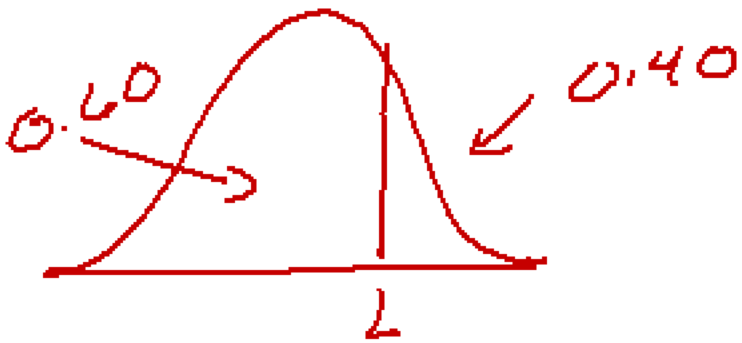


$$\text{normcdf}\left(0.25,\ 0.27,\ 0.26,\ \frac{0.12}{\sqrt{33}}\right) =$$

pop param

$$p = P(\text{spade}) = \frac{1}{4} = \frac{13}{52}$$

success

$p = 0.90$

$n = 10$

$B(10, 0.9)$

$\cancel{10(0.9) \geq 10}$

$\cancel{10(0.1)}$

$P(x=8)$ =

$= \text{binompdf}(10, 0.9, 8)$

$P(x \geq 8) = 1 - P(x \leq 7)$

$1 - \text{binomcdf}(10, 0.9, 7)$

$\leq$

Combining μ and σ

Means

1. $\mu_{a+bx} = a + b\mu_x$
2. $\mu_{x+y} = \mu_x + \mu_y$
3. $\mu_{x-y} = \mu_x - \mu_y$

Std. dev - work in variances, take $\sqrt{\ }$

1. $\sigma^2_{a+bx} = \sqrt{b^2\sigma_x^2}$
2. $\sigma^2_{x+y} = \sigma^2_{x-y} = \sqrt{\sigma_x^2 + \sigma_y^2}$

X and Y

$\bar{X}$ and $\bar{Y}$

Ex: $T \sim N(110, 10)$

$G \sim N(100, 8)$

$$\mu_{T-G} = \mu_T - \mu_G = 110 - 100 = 10$$

$$\sigma_{T-G} \Rightarrow \sigma_{T-G}^2 = \sigma_T^2 + \sigma_G^2 = 10^2 + 8^2 = \sqrt{164} = \underline{12.806}$$

$$\boxed{T-G \sim N(10, 12.806)}$$

$P(T-G < 5)$

$$\text{normcdf}(\overset{}{-E99}, 5, \underset{}{\overset{\mu_{T-G}}{\downarrow}}\!\!\!\!\!10, \overset{\sigma_{T-G}}{\downarrow}\!\!\!\!12.806) = 0.3481$$

$N(10, 12.806)$

$\bar{x}$ and $\bar{y}$

$n_T = 40$

$n_G = 50$

Tom's sample

$\bar{T} \sim N\left(110, \frac{10}{\sqrt{40}}\right)$

George's

$\bar{G} \sim N\left(100, \frac{8}{\sqrt{50}}\right)$

$\bar{F}-\bar{G}$

$$\mu_{\bar{F}-\bar{G}} = \mu_{\bar{F}} - \mu_{\bar{G}} = 110-100 = 10$$

$$\sigma_{\bar{F}-\bar{G}} = \sigma^2_{\bar{F}-\bar{G}} = \sigma^2_{\bar{F}} + \sigma^2_{\bar{G}}$$

$$\left(\frac{10}{\sqrt{40}}\right)^2 + \left(\frac{8}{\sqrt{50}}\right)^2 = \frac{100}{40} + \frac{64}{50} = \sqrt{3.78} = 1.94422$$

$$\bar{F}-\bar{G} \sim N(10, 1.94422)$$

$$P(\bar{F}-\bar{G} < 5) = \text{normcdf}(-E99, 5, \underset{\mu_{\bar{F}-\bar{G}}}{10}, \underset{\sigma_{\bar{F}-\bar{G}}}{1.94422}) = 0.00506$$

1

a) $\bar{g} \sim N\left(2.85, \dfrac{0.25}{\sqrt{60}}\right)$

b) $\bar{b} \sim N\left(2.9, \dfrac{0.3}{\sqrt{80}}\right)$

c) $\mu_{\bar{b}-\bar{g}} = 2.9 - 2.85 = 0.05$

$\sigma_{\bar{b}-\bar{g}} \Rightarrow \sigma^2_{\bar{b}-\bar{g}} = \sigma^2_{\bar{b}} - \sigma^2_{\bar{g}} = \left(\dfrac{0.3}{\sqrt{80}}\right)^2 + \left(\dfrac{0.25}{\sqrt{60}}\right)^2$

$= \sqrt{0.0021667} = 0.0465$

$\boxed{\bar{b}-\bar{g} \sim N(0.05, 0.0465)}$

d) $P(\bar{b}-\bar{g} < 0.1) = 0.85887$

② a) $P(J<K) = P(J-K<0) =$

normcdf$(-E99, 0, 0.3, 0.3905) = 0.22117$

b) $\bar{K} \sim N(5.5, \frac{0.25}{\sqrt{10}})$

$\bar{J} \sim N(5.8, 0.3/\sqrt{10})$

c) $\mu_{\bar{J}-\bar{K}} = 0.3$

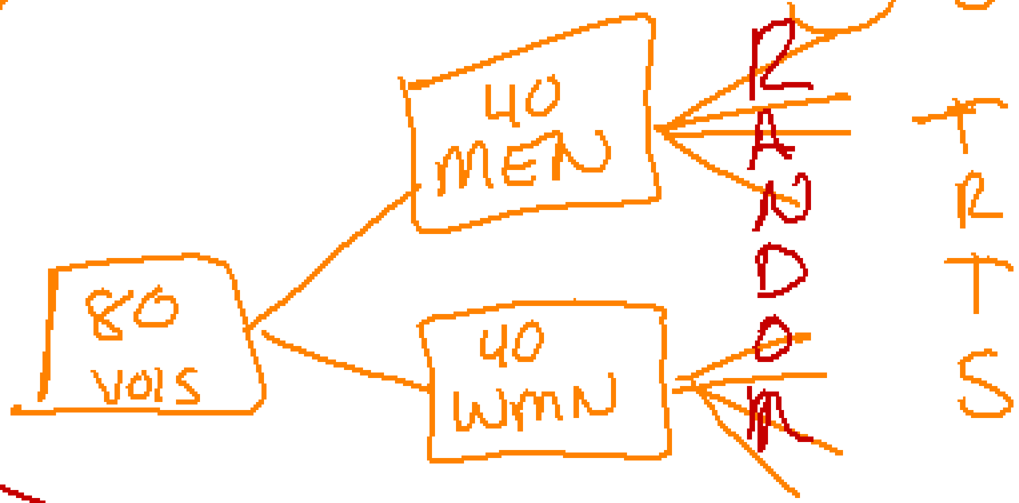
$\sigma_{\bar{J}-\bar{K}} = 0.1235$

$P(\bar{J}<\bar{K}) = P(\bar{J}-\bar{K}<0) = 0.007567$

#4

10pts

* Block first by gender



Trts

Full credit

T1: 3 plac. 0 med

T2: 2 pl. 1 med

T3: 1 pl. 2 med

T4: 0 pl. 3 med

−3 pts

1 med
2 med
3 med

1 plac.
2 plac.
3 plac.

−5 pts

T1: 1 med

T2: 2 med

T3: 3 med

T4: control/plac.

CH. 5

Given:
$\mu, \sigma \Rightarrow$ sample means

check: normal pop
or
$n \geq 30$

Given:
$n, p \Rightarrow$ binomial

check: $n \cdot p$
$n(1-p)$ ≥ 10